

Maternal and Newborn Mortality: Community Opinions on Why Pregnant Women and Newborns Are Dying In Natikiri, Mozambique.

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ABSTRACT

Background and objective: maternal and neonatal mortality rates in Mozambique are high, due to insufficient numbers of qualified health workers, lack of equipment and materials, referral system deficiency, difficulties to access health services and gender issues. This study assesses the barriers to health care access, regular attendance at ante natal consultations, institutional delivery and postnatal and neonatal follow-up. This is part of the baseline study for an implementation research project to reduce maternal and neonatal mortality in Natikiri, Nampula, Mozambique.

Methods: descriptive mixed study with two components: 1) data analysis from primary sources (interviews and focus group discussions with community members, health professionals) in the catchment area of Marrere health center and hospital, in Natikiri; 2) data analysis of secondary sources (national and international literature).

Results: 300 people were surveyed and 11 focal group discussions were held. Respondents were asked why they thought pregnant women and newborns were dying in their community. Local community members and health professionals some reasons:

1. Long walking distances required to reach health services.
2. Unsafe travel conditions for women.

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3. Poor treatment in health facilities including illicit payments and bribes.
4. Long waits to be attended to.
5. Poor training and lack of knowledge of health professionals.
6. Health professionals neglecting patients and not giving family centered care.
7. Teenage pregnancies and short spacing of pregnancies.
8. Inability of women to make informed decisions about family planning.
9. Home births without trained support and traditional methods of treatment.
10. Myths and cultural taboos about pregnancy and newborn care.
11. Women and community limited knowledge about women and adolescent girls' health.
12. Need of "mother's house waiting" near the hospital for pregnant women.
13. Weak government policies and little funding to support maternal and child health care.

Discussion: literature review identified several factors causing delay in pregnant women and newborns' appropriate care. These poor quality determinants on primary and secondary health care, for pregnant and newborn, can be grouped

into three delays: (1) the decision to seek care by pregnant woman and woman who have delivered; 2) accessing and arriving at the health center; 3) receiving quality health care.

Conclusion: local community members and health professionals were asked to state what they thought would be the best way to intervene. These ideas were then discussed further at a conference with health professionals and government representatives. Six intervention strategies to address identified problems were decided on and will be the basis for the ongoing implementation research project. They were:

1. Expanding family planning especially with adolescents.
2. Community based transport system for pregnant women.
3. Strengthening maternal and child health services by training maternity personnel in obstetrical emergency care and neonatal resuscitation.
4. Providing four quality prenatal visits.
5. Providing quality cesarean deliveries.
6. Supporting the Mozambican Government's campaign against bribery.



Keywords: access, prenatal, consultation, pregnancy, puerperium, newborn, Mozambique.

1. Introduction

This study carried out by Lúrio University (UniLúrio) Health Sciences Faculty (HSF) in partnership with Nampula Provincial Health Directorate (NPHD), Marrere Hospital (MH) and the University of Saskatchewan, Saskatoon, Canada constitutes part of the baseline evaluation for an implementation research on maternal and newborn health.

Every day, about 800 women die from preventable causes related to pregnancy and childbirth. Almost three million newborn babies die each year and 2.6 million babies are stillborn.¹

The World Health Organization (WHO) defines maternal mortality as the death of a woman during pregnancy or up to 42 days after giving birth, irrespective of the duration and place of the pregnancy, due to any cause related or aggravated by pregnancy or its management. Currently maternal and neonatal mortality rates in Mozambique are unacceptably high: 4,800 maternal deaths during the year 2013.²

The complications responsible for almost 75 % of maternal deaths in the

world are: severe bleeding and infections (usually after childbirth), high blood pressure during pregnancy (preeclampsia and eclampsia), other childbirth and unsafe abortion complications.³

In Mozambique, about 43 % of maternal deaths occur during childbirth and up to 24 hours later, 76 % of these deaths were due to direct causes and 24 % to indirect causes. Among main causes of death are uterine rupture (17 %), postpartum haemorrhage (14 %), preeclampsia and eclampsia (13 %), Acquired Human Immunodeficiency Syndrome (AIDS) (12 %) and puerperal sepsis (11 %). AIDS appears as the first indirect cause of maternal death and the fourth leading cause. In primary health care (PHC) units death occurs more frequently before the woman reaches the first two hours of hospitalization, showing the precarious conditions and women's late arrival to the health center (HC).⁴

The main causes of neonatal morbidity and mortality are prematurity and low birth weight, asphyxia, sepsis, pneumonia, human immunodeficiency virus (HIV), malaria, diarrhea, syphilis and other congenital infections. In addition to these factors, the low frequency of institutional delivery, (54 % in 2011), the reduced quality and

quantity of antenatal consultations (ANC) also contribute to morbidity and mortality.^{5,6}

In Mozambique, among other determinants of maternal and neonatal deaths, are the shortage of qualified personnel in the HC, poor quality and quantity of materials and equipment, low quality care, deficiency in referral system, long travel distances to the HC, lack of transportation, poor communication between health professionals (HP) and the community, and gender issues such as the low decision-making power of women and low literacy levels.^{7,8}

These factors can be grouped using the three-delay model: 1) delay in the decision to seek appropriate maternal or neonatal health care; 2) delay in arrival to the HC; 3) delay in receiving timely and appropriate obstetric or neonatal emergency care.⁹

The national health system (NHS) covers 40 % of the population with hospital care and 60 % in PHC. The remaining population is covered by a community network composed of traditional midwives (TMW) and traditional health practitioners (THP).

A study in Mali showed that organized participation of TMW improved the

access of women to ANC, institutional delivery, neonatal follow-up and children vaccination.¹⁰

Well equipped maternities with trained personnel are key to provide skilled birth attendants and deal with obstetric complications. However there is a persistence of inequities in HC distribution in the country: about half of pediatricians and obstetricians are concentrated in Maputo, the Mozambican capital.

The proportion of births in Mozambique in HC with trained birth attendants increased from 48 % in 2003 to 55 % in 2011 but neonatal mortality has declined more slowly than infant and child mortality. This puts the country still far from achieving the annual decline needed to achieve the Sustainable Millennium Goals (SMG).¹¹

Considering the importance of delivery and birth care for maternal and neonatal health, it is necessary to invest in actions with a positive impact on this reality. The best potential to modify the situation is in the puerperium and immediate postpartum (the first 24 hours after childbirth) where 24 to 45% of neonatal and 45% of maternal deaths occur.^{12, 13}

Several programs have been developed in Mozambique to reduce maternal and

neonatal mortality. One is the distribution to pregnant women of the Women's Health Handbook.¹⁴ The Community Health Program, implemented through Local Health Councils, aimed to reduce family and community barriers to access ANC and increase social mobilization. Another program focused on sexual and reproductive health (SRH) barriers, by building "Mother's Waiting Homes" to house mothers near the HC while awaiting delivery, reviewing the abortion law, using information from both men and women and extending the coverage of SRH services.¹⁵

The creation of Hospital Co-management Committees, participated by HP and managers and community members who work together in the planning, implementation, follow-up and evaluation of activities, including analysis and decision-making in the HC and the community, aims to improve health services' performance.¹⁶

The Model Maternity Program aims to improve the quality of delivery and the humanization of health services to women and children, but to date with a reduced implementation.¹⁷

The objective of this study is to evaluate the barriers to access and adherence to

ANC, institutional birth and follow-up during puerperal and neonatal periods in the HC and MH. The secondary objectives were: (a) analyze local community' perception about pregnancy, childbirth, care during puerperal and neonatal periods; b) assess HP providing Maternal and Child Health (MCH) assistance' knowledge in HC and MH, regarding barriers to access and attendance; c) evaluate TMW and THP knowledge regarding pregnancy, childbirth and care during the puerperal and neonatal periods.

2. Methods

Descriptive mixed-methods research, using quantitative and qualitative data collection from two sources:

- 1) data analysis from secondary sources (scientific communications, HC and MH reports and programs, scientific articles, national policy and strategy reports, population and health surveys, population census, national and international data).
- 2) data analysis from primary sources (interviews with provincial department members responsible for MCH, district medical director, MH and HC workers in the area of MCH, TMW, THP, Natikiri community members including women of childbearing age, pregnant women,



postpartum women, adolescents, fathers, elderly women and community leaders). Interviews used semi structured questionnaires, pre-tested and approved, addressing questions about pregnancy, childbirth and care during puerperium and neonatal period.

Focal group discussions (FGD) were conducted with MCH workers, TMW, THP, community members including women of childbearing age, pregnant women, post-partum women, adolescents, parents, grandparents and community leaders residing in the same area with two questions: why are women and children dying during pregnancy and the newborn period in your community? Secondly, what are possible solutions to the problems identified?

Statistics and reports regarding numbers of deliveries and complications occurring at the HC and MH (hospital for Natikiri district) were collected.

The study was approved by the Institutional Committee on Health Bioethics of Lúrio University and the Behavioral Ethics Board at the University of Saskatchewan.

A representative sample of women of childbearing age was calculated using the Epi Info TM 7.2 program considering the size of the target population, the

expected frequency, with a margin of error of 10% and a 95% confidence interval. The sample size for heads of households was the same as for women of childbearing age: heads of households were considered as partners of women of childbearing age. The same sample size was considered for older women (above 45 years): considered as mothers / mothers-in-law of women of childbearing age. A total of 125 THP operate in the intervention area and the choice of a representative sample used Epi Info TM 7.2 program with the expected frequency of 50%, with a 10% margin of error and a 95% confidence interval. TMW, HP and community leaders willing to participate in the interviews were included.

The estimated sample size for the interviews was 328 people (72 women of childbearing age, 72 male heads of households, 72 elderly women, 54 THP, 32 TMW, 14 HP and 12 community leaders.

11 focus groups were formed with at least 5 participants and a maximum of 12 participants in each group: two groups of women of childbearing age over the age of 18, one for mothers under the age of 18 (adolescents), one for heads of households, one for elderly

women over 45, one for community leaders, one for THP, two of TMW and two of HP.

Participants included had the following criteria:

1. Women of reproductive age, pregnant women, puerperal women over 17 years of age.
2. Adolescents of reproductive age, pregnant, puerperal women aged 17 years or less.
3. Head of household (parents, mothers-in-law and grandparents).
4. Community leaders.
5. HP.
6. THP, TMW.
7. Those who are able and willing to give informed consent.

Different variables and information supports were used for each target group in interview sheets with multiple choice questions and answers (adapted Likert scale):

- 1) Woman of childbearing age: age, residence, household number, level of schooling, number of pregnancies, number of institutional births, number of abortions; trimester of pregnancy in which the first ANC was performed; number of ANC visits during the last pregnancy; number of follow-up visits for the child during the first year; reason

for delay in prenatal and non-institutional delivery (42 questions).

- 2) Elderly woman (mother in law or grandmother): age, residence, number in household, level of education; cause invoked for delay in prenatal and non-institutional delivery (41 questions).

- 3) Head of household: age, residence, number of people in household, level of education, occupation, number of children (41 questions).

- 4) HP: age, gender, profession, position, reasons for delayed ANC visits and non-institutional delivery (40 questions).

- 5) THP / TMW: age, gender, residence, reasons for delayed ANC visits and non-institutional delivery (41 questions).

- 6) Community leader: age, gender, area of residence, level of schooling, reason for delayed ANC visits and non-institutional delivery (41 questions).

- 7) Hospital indicators and statistics: maternal and newborn statistical data collection sheets.

Marrere, in the Administrative Post of Natikiri, City and District of Nampula, is located to the west of the city in plateau zone, mainly of sedimentary soil with granite outcrops and is crossed by six Rivers (Namialo, Marrere, Muepelume, Mussarne, Monapo, Mutivazi). Climate is tropical humid (rainfall > 1,000 mm /

year). Urbanization is deficient (minimal roadways, water supply, domestic sanitation and solid waste collection system) and the population is mostly dispersed, residing in precarious housing of traditional model.

It is estimated that childbearing age women population reaches 10,088 inhabitants (18 % of the total population).

Traditional authorities play an important role in social organization and culture imposes rules and taboos related to pregnancy, childbirth and newborns, often with a negative impact on their health.

MH is located in Marrere subdivision of Natikiri, 12 km from the central part of the city. It is associated with an HC, near a secondary school and refers more difficult health issues to Nampula Central Hospital (NCH) in Nampula city. The radius of the catchment area of MH is about 15 km, with an estimated population of 56,025. It provides pediatric, maternity, emergency, general medicine, basic surgery, radiology, pharmacy, blood bank, vaccination program, and administrative and support services. It has a total of 140 in patient beds. It serves as a site for nursing and medical students training periods and,

participates in the training of allied HP (students of the Health Sciences Institute of Nampula). It is the referral hospital for patients with tuberculosis in the northern part of the country. In 2015, 1,560 births were attended. There are 12 beds for obstetrics and gynecology services. The HP for the care of women and newborns consist of four general practitioners, eight nurses with maternity training, six with basic maternity training and four elementary midwives. There are no Obstetrician / Gynecologists at the hospital.

The interviews and focus groups were done using a Macua (local language) translator.

Data collection focused on the following areas:

A) Challenges faced by pregnant women in the community, preventing them from accessing and joining ANC visits and monitoring during the puerperium and neonatal period.

B) Challenges faced by pregnant women on the way to the HC / MH, preventing them from accessing and joining ANC's and follow-up during the puerperium and neonatal period.

C) Challenges faced by pregnant women in the HC / MH, preventing them from accessing and joining ANC visits and

follow-up during the puerperium and neonatal period.

D) What is there in communities, HC and MH that is working well and what should be improved in relation to pregnancy, childbirth and neonatal period?

E) Existing traditional knowledge in the community related to pregnancy, childbirth and birth.

F) Perception of mothers, pregnant women, postpartum women on ANC and follow-up during the puerperium and neonatal period.

G) Perception of parents and community leaders about ANC visits and follow-up during the puerperium and neonatal period.

H) Perception of TMW and THP on ANC visits and follow-up during the puerperium and neonatal period.

I) HP perception about ANC visits and follow-up during the puerperium and neonatal period.

Data were collected by a team of research assistants composed of students of the UniLúrio medical and nursing courses who speak the local language (Macua) after theoretical and practical

training, including pre-testing of data collection instruments.

Participants were interviewed in their most comfortable language (Portuguese or Macua) to improve understanding of the questions and the elaboration of the answers. To maximize the freedom to speak and eliminate problems of gender bias, repression and domination, participants were interviewed separately by gender.

Data qualitative analysis was thematic. The transcripts of the research assistants were typed in Microsoft Excel format and processed. Afterwards the summaries of the main ideas and observations were organized according to the opinion of the majority.

The study was authorized by HSF Board and Scientific Committee, NPHD, the Secretariat of the Administrative Post of Natikiri, the Lúrio University Institutional Health Bioethics Committee and the Bioethics Committee of the University of Saskatchewan, following all Helsinki Declaration (2013) recommendations.

No changes were made in the study procedures to the initial protocol.

3. Results

300 people were surveyed (see Table I) and 11 FGD were held (see Table II).

Table I: sample of subjects interviewed.

Women of Childbearing Age	77
Male Heads of Households	78
Older Women	75
TMW and THP	46
Community Leaders	15
Maternal Child Health nurses	9
Total	300

Table II: focus groups discussions.

Women of Childbearing age	1
Male Heads of households	1
Adolescent mothers	1
Older Women	1
Community Leaders	1
TMW	2
THP	2
Maternal Newborn care nurses	2
Total	11

The answers on the questionnaire were classified using the Likert scoring system

(Always = 1, Sometimes = 2, Never = 3). The mean and standard deviation for each response was calculated and compared between groups. Consistent themes emerged across all groups and were supported by data from shared testimonies in the FGD. The consistent themes found were:

1. Limited knowledge about maternal health and family planning (FP) needs.

2. Lack of transportation to access maternal newborn health care.

3. Poor quality of maternal health care.

4. Continued need for government support and funding for maternal newborn care.

Due to the limited knowledge and access to FP women become pregnant again a very short time after delivery. Nurses (to a greater extent) and men (to a lesser extent) recognize this concern (see Table III). A maternal newborn nurse in the focus group justifies this situation:

"There are mothers who forbid contraceptives spoil the girls' daughters to continue the FP because reproductive system." they want grandchildren and say that

Table III: spacing between pregnancies.

Question: the majority of women become pregnant too soon after their last delivery? 1= always, 2 =Sometimes 3 = Never			
Group	N	\bar{x}	s.d.
Men	78	2.08	0.79
Women of childbearing age	77	1.82	0.66
Older Women	75	1.85	0.73
Community Leaders	15	1.67	0.62
Maternal Newborn nurses	9	1.33	0.50
TMW and THP	46	1.85	0.69

Another recognized problem is the high frequency of early pregnancy; a community leader in a FGD said:

"The issue of early pregnancy is worrying and those in the community do not know how to overcome this problem, but people in the community care a lot."

Women find it difficult to access health care because transport options are limited. All groups reported that women go on foot to consultations and rarely went by public transport or by car.

Unsafe travel conditions were also cited as one of the main concerns (see Table IV). A community leader participating in a FGD summarized the situation:

"They require lights on public roads and paths. This could make it easier for people to go to the hospital at night, and it would also help if a woman gives birth on the way to the hospital ".

Table IV: access to care for pregnant women.

Question: Do women go to antenatal visits on foot? 1= always, 2 = sometimes 3 = never			
Group	N	\bar{x}	s.d.
Men	78	1.67	0.62
Women of Childbearing Age	77	1.41	0.61
Older Women	75	1.52	0.81
Community Leaders	15	1.40	0.57
Maternal Newborn nurses	9	1.78	0.44
TMW and THP	46	1.41	0.69

The quantitative results did not provide a clear picture of the HC experience of maternal and newborn health care. However, qualitative evidence demonstrates knowledge of specific difficulties for quality health care. A FGD participant parent said:

"When I arrived with my wife, the maternal health nurse did not greet us sympathetically and I could say she despised us, perhaps because we seemed very poor."

A THP said:

"Once there was a woman in labor and the maternal newborn nurse simply abandoned her and went to bed. When the TMW tried to help her, the maternal newborn nurse threatened to leave the woman in labor and also insulted the TMW".

One parent reinforces:

"When I arrived with my pregnant wife crying in pain, the maternal newborn nurse said to my wife laughingly: you are crying now, but what were you

thinking when you were doing these things (sex)?"

A community leader adds,

"One of the mothers said that when she was pregnant, at the time of delivery, after being admitted, the maternity nurse asked if she had any money. She asked how much, but the maternity nurse did not answer but left her alone during labor and she gave birth alone. She just called the maternity nurse to finish the rest. "

Maternal, neonatal and child health, in the opinion of the participants, is considered a priority for the Government of Mozambique. This result is evident both in the quantitative data (see Table V) and in the FGD.

Table V: how does the Government value maternal and newborn health?

Question: Maternal health is an important priority for the government 1= always 2 = sometimes 3 = never			
Group	N	\bar{x}	s.d.
Men	78	1.83	1.21
Women of Childbearing Age	77	1.62	1.00
Older Women	75	1.23	0.56
Community Leaders	15	1.27	0.46
Maternal newborn nurses	9	2.11	0.78
TMW and THP	46	1.61	1.02

But the continuing need for Government support and funding of policies for maternal and newborn care is also

recognized. A maternal newborn nurse participant in a FGD said:

"The Ministry of Health should continue to require husbands to accompany their



wives to ANC visits because FP is explained in detail in these visits."

One community leader said:

"One of the biggest problems is that TMW do not feel valued or recognized in the HC and do not receive any payment. They work but receive nothing in return and are requesting, at least, some payment."

A parent head of household said:

"Sometimes the Government provides some support to the community, like mosquito nets and meals for children or pregnant women, to combat malnutrition, however, there is a need for transparency in distribution so that community leaders and HP do not prevent supplies from reaching the community and keep them for personal gain."

The main results can be summarized in the themes that were consistently present in all FGD:

1. Long walking distances required to get to the HC or MH.
2. Unsafe travel conditions for women who walk alone.
3. Bad treatment in HC including illicit payments and bribes.
4. Long waits to be attended in the HC or MH.
5. HP poor training and knowledge.

6. Neglect and lack of family centered care.

7. Women who become pregnant very soon after their last birth or at very young age.

8. Inability of women to make informed decisions about FP.

9. Continued practices of home births and traditional methods of treatment.

10. Myths and cultural taboos about pregnancy and newborn care.

11. Limited knowledge and understanding among women and the community regarding the health needs of women and young people.

12. Need for "Maternity Waiting homes" near the hospital for pregnant women.

13. Weak Government policies and little funding to support MCH care.

FGD participants identified priorities for maternal and newborn health:

- 1) Transportation options to meet the long distances needed to reach the HC.
- 2) Lack of attendance at ANC visits and neglect of maternal care needs.
- 3) Poor and insufficient service in MH.
- 4) Lack of qualified HP in childbirth care.
- 5) The need for Government policies to support adherence to maternal care and respectful treatment for mothers.

4. Discussion

International literature review
identifying factors causing delay in the
search for care and treatment by
pregnant and newborn confirm this study
results:

18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33,34,35,36,37
,38,39,40,,41,42,43,44,45,46,47,48,49, ,50,51,52,53,54,55

1) Delay in the decision to seek care:

a) Decision to seek health care is
dependent on husband.

b) Decision to use FP is
dependent on husband.

c) Lack of knowledge of
pregnancy warning signs.

d) Lack of basic knowledge
about SRH.

e) Lack of support for household
chores.

f) Lack of confidence in the
health system.

g) Cultural taboos and witchcraft.
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h) Poor participation of men in
maternal and neonatal care.

i) High cost of health services.

2. Delay on arrival at HC:

a) Long distance to HC.

b) Lack of money for
transportation payment.

c) Lack of means of transport.

d) Conditional authorization to
seek health care.

e) Do not have a trusted or
supportive person.

3. Delay in providing quality care

a) Hospital lacking HP.

b) Hospital lack of resources.

c) Maternal newborn nurse
professional negligence.

d) Maternal newborn nurse
professionals with poor training.

e) Maternal newborn nurse
services not being a Government
priority.

5. Conclusion

The baseline study and consultations
with local community and institutional
partners, indicate six intervention lines,
evidence based, that might reverse the
problems identified. These are:

1. Expanding FP especially with
adolescents.

2. Community based transport system
for pregnant women.

3. Strengthening maternal and child
health services by training maternity
personnel in Obstetrical Emergency
care (EmOC) and neonatal
resuscitation (Helping Babies
Breath).

4. Providing four quality prenatal
visits.

5. Providing quality cesarean
deliveries.



6. Supporting the Mozambican bribery.
government's campaign against

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